

HP DesignJet 650C Plotter

Setting Up for Plotting



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Regulatory information can be found in "Regulatory notices" toward the back of the manual.

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Please give us your feedback on the quality of these manuals.

	Setting Up for Plotting					Using the Front Panel		
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Completeness	1	2	3	4	5	1	2	3
Accuracy	1	2	3	4	5	1	2	3
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1=Far below
expectations

2=Below
expectations

3=Meets
expectations

4=Exceeds
expectations

5=Far ex
expecta

Please give us your feedback on the quality of these instructions (found in the two manuals).

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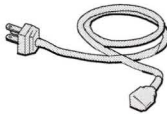
Setting Up for Plotting

HP DesignJet 650C Plotter

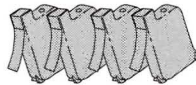
Before you begin...

- Assemble your plotter using the unpacking instructions in the shipping box. This book assumes that you have completed all of the steps of the unpacking instructions.
- Inspect the plotter and the accessories that were shipped with it. If you received the plotter in damaged condition, notify the dealer or HP Sales and Support Office where you purchased the plotter, and file a claim with the carrier.
- Along with your plotter and computer, have the following items available when you use this manual. These items were shipped with the plotter.

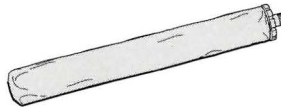
power cord



four pen
cartridges



HP special
inkjet roll
media



Additionally, you will need an interface cable to connect your computer and plotter. If you do not already have your interface cable, refer to the "Choose an interface cable" in this guide.

Using your manuals

The following describes your plotter's three manuals.

- *Setting Up for Plotting* (this manual) describes how to load media and pens, along with how to connect the plotter to a computer.
- *Using the Front Panel* describes how to use the features you find on your plotter's front panel and in its menu structure.
- *HP DesignJet 650C Quick Reference Guide* summarizes some information you may need while using the plotter (you should place this manual in the pocket on the back of the plotter).

Getting started...

Use this manual to help you set up your plotter for the very first time. Afterwards, use it as a reference for routine activities, such as loading media and pens.

Refer to...

- the following pages to connect the power cord, turn on the plotter, and set your front panel language.
- *Section 1* to load media and pens.
- *Section 2* to connect the plotter to a computer.

The HP DesignJet 650C plotter is a large-format, color plotter that uses HP's inkjet technology. This plotter produces high quality drawings for engineering and mechanical drafting/design applications.

Here are some key features:

Color plotting You can create vibrant 300 dpi color output on HP special inkjet paper. Black (monochrome) plots are possible on paper, vellum, translucent media, HP inkjet polyester film, and HP special inkjet paper.

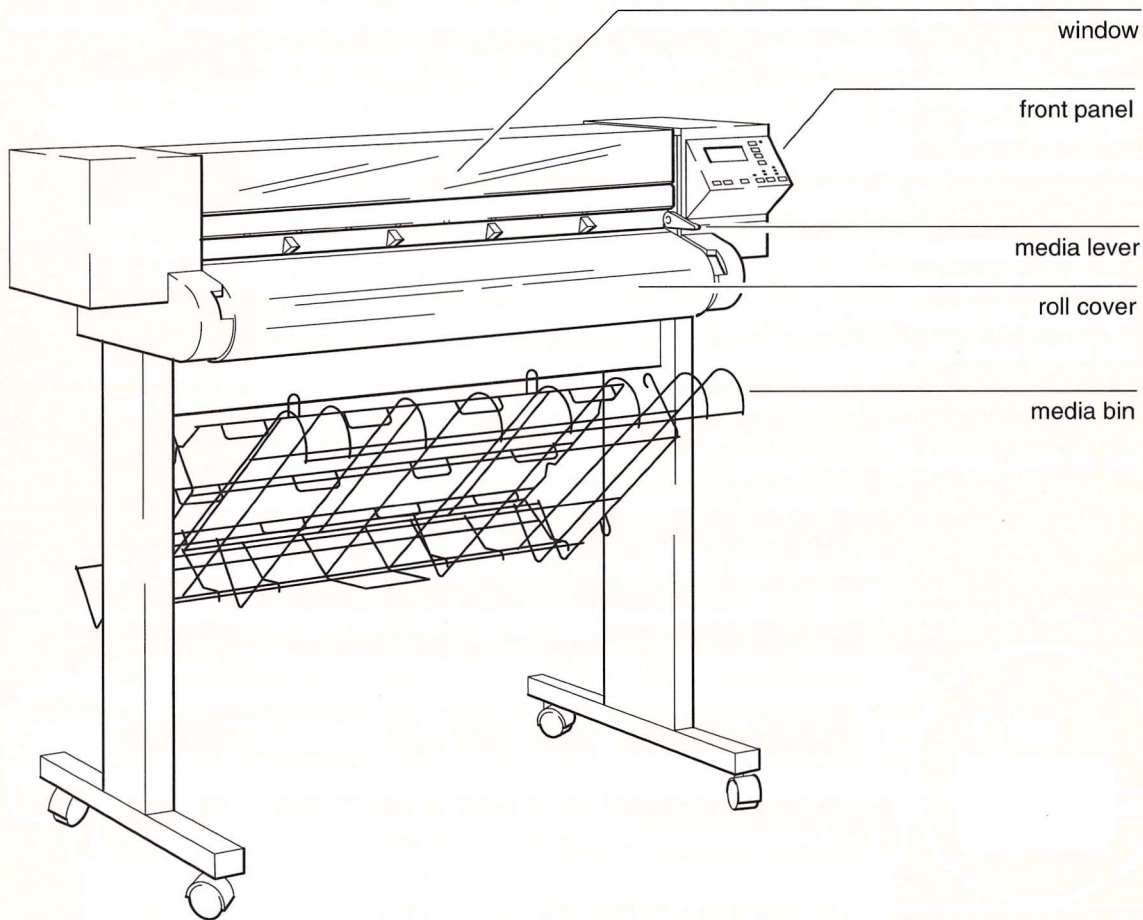
Sheet and roll loading You can load standard-size sheet media in standard from A4/A through A1/D (for the D-size model) or A0/E (for the E-size model), including architectural sizes. The plotter can support many non-standard sizes, also. For roll media, load either 24- or 36-inch widths.

Automatic cutter and output bin for unattended plotting Automatically cuts and stacks up to 20 drawings without user intervention.

Draft, Final, and Enhanced plotting modes Use the plotter's front panel to choose the combination of speed and quality that suits your needs for each drawing.

Centronics parallel, serial (RS-232-C), and (optional) interface options The plotter comes with parallel and serial (RS-232-C) interfaces. There is also a slot for an optional interface card (such as an HP JetDirect interface card), which can be purchased separately for additional connectivity.

4–20 MB installed RAM Unless you purchase additional memory, the plotter comes equipped with 4 MB of RAM. You can install up to 16 MB more RAM, for a total of 20 MB RAM.



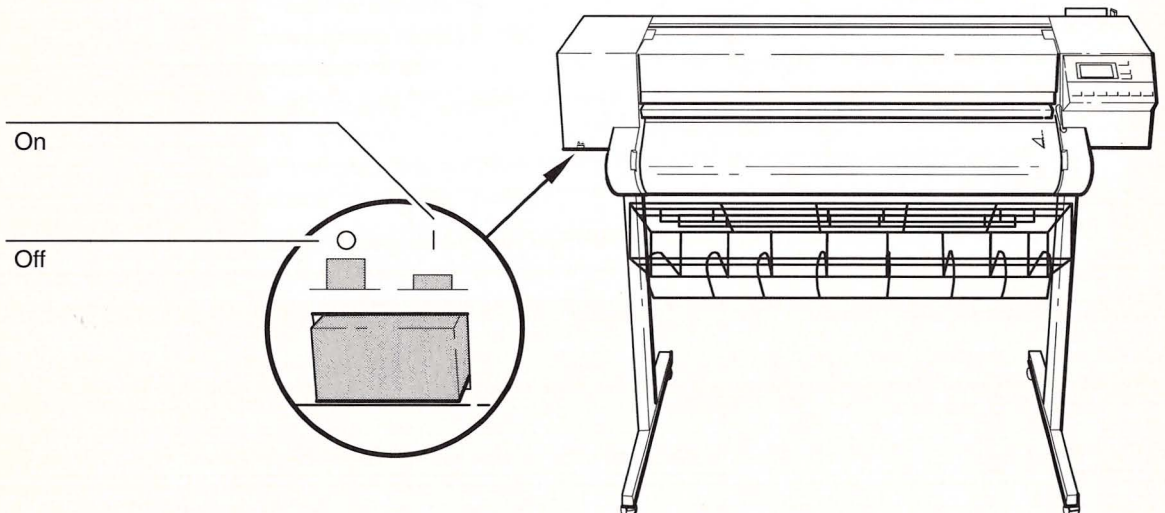
Connect the power cord

- 1 Make sure the power switch on the front of the plotter is extended (off).
- 2 Plug the power cord into the power socket on the back of the plotter, then into your power outlet.

WARNING

Be sure the power cord supplied with your plotter matches your AC power connection requirements. Use only three-wire (earth grounded) power cords with this plotter.

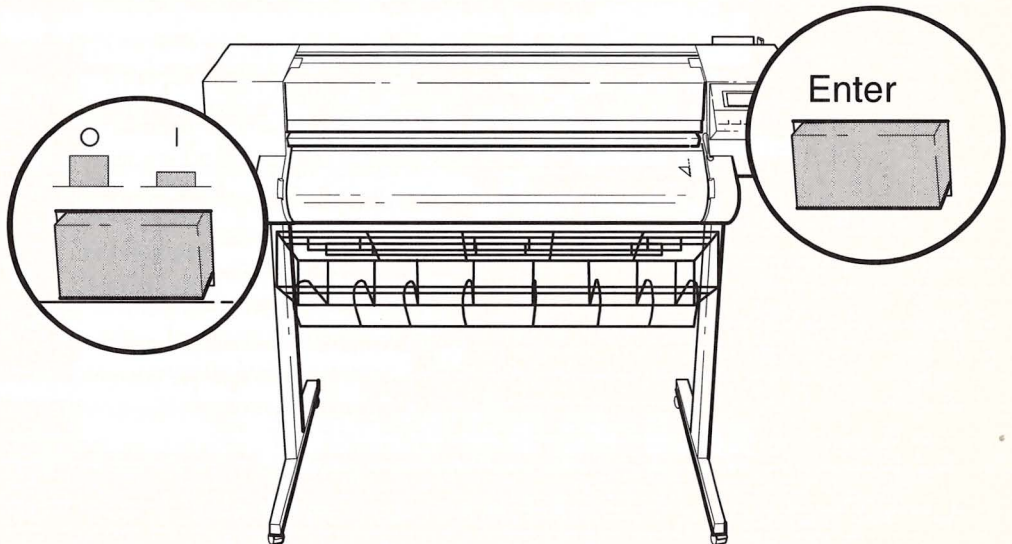
- 3 Push the power switch in to turn on the plotter.



Set your language

- If the front panel display shows “STATUS/Ready for media” in your language, continue with the procedures in section 1 to load media and pens.
- If the plotter’s front panel display shows “LANGUAGE/English” and English is not the language you want, press either ↑ or ↓ until the language you want displays, then press the **Enter** button (next to the front panel display). If your language is English, press the **Enter** button and continue with section 1.
- If another message displays in a language you don’t understand, turn off the plotter. Hold down the **Enter** button as you turn on the plotter (hold **Enter** until the plotter begins to initialize). Press either ↑ or ↓ until the language you want displays, then press the **Enter** button (next to the front panel display).

When the front panel display is in a language you understand, refer to section 1 to load media and pens.



In This Book

This manual is your guide to performing routine activities and connecting your plotter to a computer.

It is not necessary to read this manual from cover to cover, you should become familiar with the procedures you will use most often and then use the *Quick Reference Guide* (which you should keep in the pocket on the back of the plotter) as a reminder.

Use section 1 to become acquainted with daily activities, such as loading media and pens. These activities are summarized in the *Quick Reference Guide*.

Use section 2 to connect your plotter to your computer.

Reference lists plotter specifications, and includes a Printer Job Language (PJP) summary.

Regulatory notices contains various regulatory statements and how to order material safety data sheets (MSDS).

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Section 1

Getting ready for plotting

Using media and pens

Chapter 1 of this section shows you how to load media; chapter 2 shows you how to load pens. Chapter 3 includes troubleshooting and maintenance information.

Selecting media

For color plots, you must use HP's special inkjet paper. This paper is coated to bring out the best color from your pens. This media is available in the following sheet sizes: A/A4, B/A3, D/A1, 30×42", and A0. It is also available in 24" and 36" rolls.

CAUTION

Use only HP special paper for color plots; the ink is not designed to be used on other media. If you use any media other than HP special paper for color plots, you must significantly increase the amount of time needed to dry the plots. Also, plain media can not absorb all of the color ink; colors will smear and damage internal plotter parts and, if such a plot is handled improperly, it could stain clothing.

For monochrome (black) plots, your plotter handles a wide variety of media. The following describes the characteristics of these media types.

Media types for monochrome (black) plotting

Opaque bond (Plotter paper)	Smooth surface, good for everyday use. Low cost.
Translucent bond	Good for diazo reproductions and preliminary drawings. Low cost.
Vellum	Diazo-reproducible, archivable, translucent. Moderate cost.
HP single-matte inkjet polyester film	Diazo-reproducible, archivable, very stable, pencil-writable on the matte side. Expensive.

Handling pens

Your plotter uses four pens: yellow, cyan, magenta, and black. The color for each pen is indicated by the color border on the pen's label.

You can operate the plotter with only the black pen loaded. Otherwise, all pens must be loaded. When you remove a new pen from its box, be sure to remove the colored tape and tab that cover the pen contacts and nozzles.

CAUTION

Touch only the plastic parts of the pen. Do not touch, wipe, or attempt to clean the pen nozzles or contacts; this will clog and damage the pen.

Be careful to match the color borders on the pen label with the dot on the pen carriage. The black pen cannot be inserted into a slot for a colored pen, but it is possible to put the colored pens in the wrong color stalls.

Always load HP special inkjet paper when you load or reseal pens. The plotter automatically aligns the pens whenever one is inserted into the pen carriage. It does this by plotting a small test pattern with each pen. You must load HP special media to make sure internal plotter parts aren't damaged.

Loading media

Caring for your media before and after the plot

Handling media

- Load HP special inkjet paper with the plotting side (coated) down. Small format media (A/A4 and B/A3) are labeled with small arrows near a corner; load these with the arrows on top. Large format special inkjet media have a small notch in a corner. When loading HP special media in a portrait (vertical) orientation, be sure the notched corner is on the right side of the leading edge (the narrow edge that goes into the plotter).
- Load curled plain media (*not* HP special inkjet paper or film) with the curl up.
- Load film with the plotting side (matte side) down.
- Handle film by the edges or wear cotton gloves. Skin oils can interact with ink and cause it to smear. Always load film with the matte side down (shiny side up).
- Make sure the leading edge of the media is straight and that you load each side evenly. Refer to “To trim a ragged edge from roll media” (later in this chapter).
- Be sure the roll media has a core with an inner diameter of 5.1 cm (2.0 inches). Roll media must be flush with the right edge of the core, not “telescoped” on the core.

Using the media bin

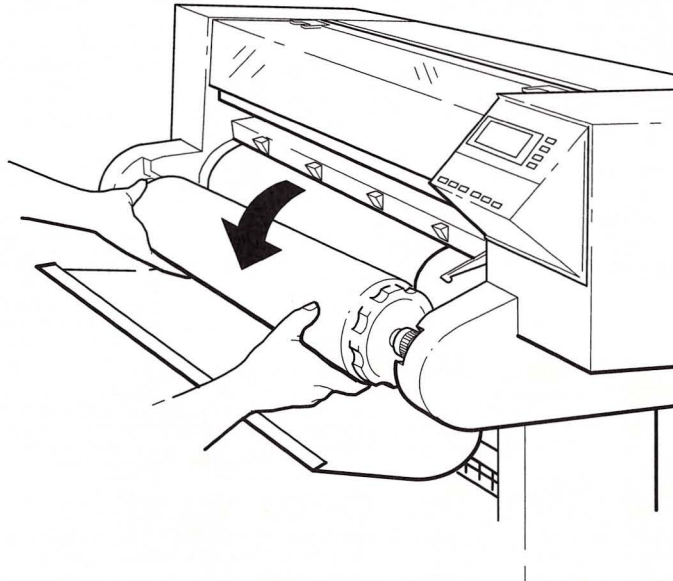
When the plotter finishes each plot on roll media, it automatically cuts and stores plots in the plotter’s media bin. You can store up to 20 plots in the media bin.

The bin has an adjustable shelf with three settings for different-sized plots. These settings keep longer plots from falling on the floor, and shorter plots from curling or shuffling in the bin. Note that mixing plot sizes can cause shorter plots to curl and shuffle in the bin.

To remove a spindle from the plotter

- 1 Open the roll cover.
- 2 Pull each side of the spindle.
- 3 Close roll cover.

You don't have to remove the spindle to load a sheet.

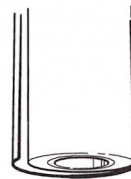
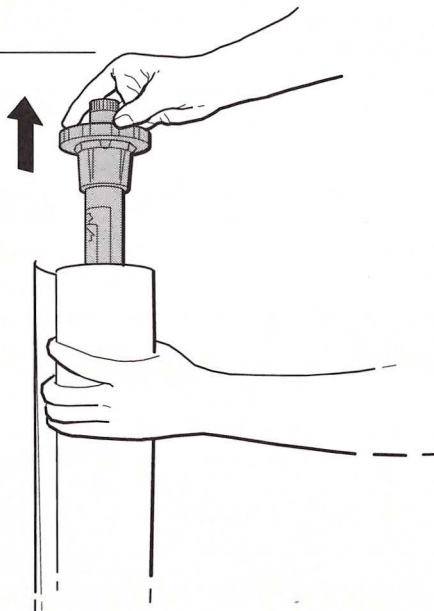


To change types of roll media

- 1 Remove the used spool from the plotter.
- 2 Rest the used spool upright on the floor so that the large, scalloped media stop is on top.
- 3 Pull out the media stop/spindle and set it aside.
- 4 From the other side of the used roll, slip out the endcap.

If you are not immediately loading another roll of media into the plotter, replace the endcap on the spindle and place the spindle back in the plotter.

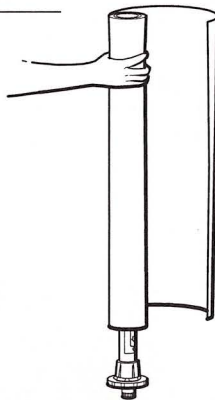
Pull out the media stop to remove the spindle.



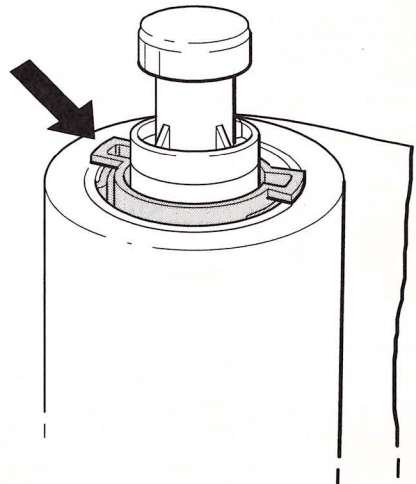
Remove end cap.

- 5 Set the media stop on the floor with the spindle up and slide the new roll onto the spindle. The leading edge of the media *must* wind clockwise.
If the media stop falls off, snap it back in. Push hard.
- 6 Push the endcap into the core, making sure the tabs are flush against the edge of the roll.

Slide roll onto spindle.
Media winds clockwise.



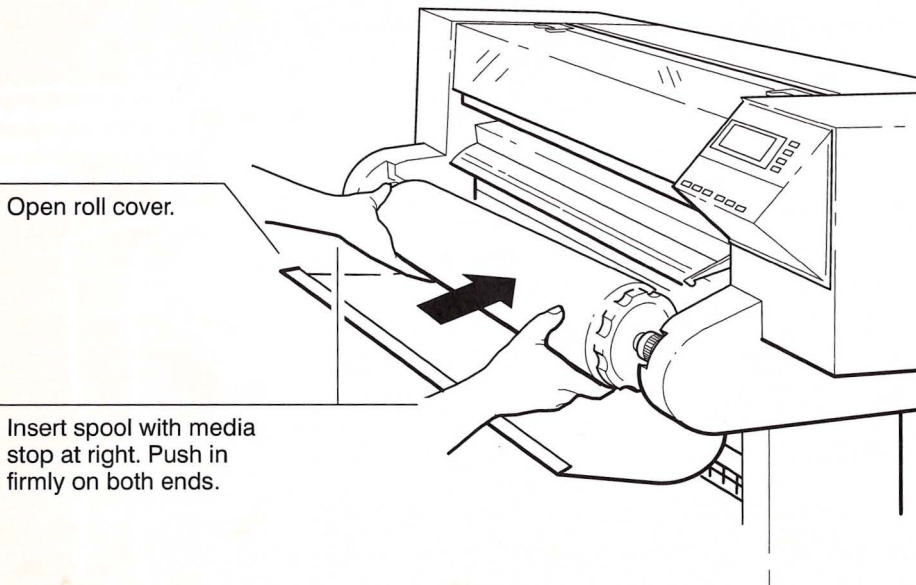
Push endcap onto spindle.



To place a roll of media into the plotter

- 1 Be sure the plotter wheels are locked to prevent the plotter from moving.
- 2 Open the roll cover.
- 3 Insert the spindle with the large media stop to the right. Push in firmly on both ends. Be sure the media remains flush against the media stop.

The media winds over the top of the roll toward you.



To trim a ragged edge from roll media

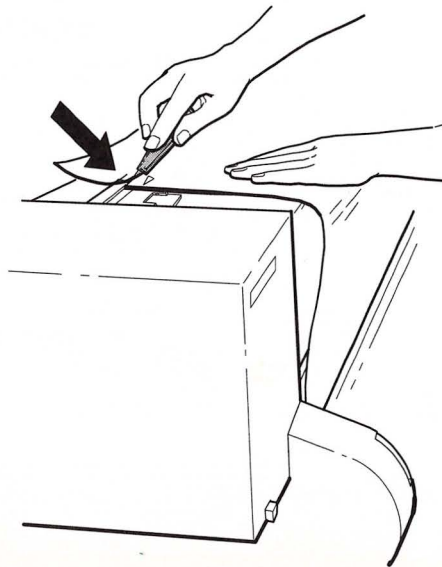
- 1 Pull the media over the top of the machine and lay it over the cutting track.
- 2 Remove the knife from the back pocket of the plotter.

WARNING

The knife blade is sharp. Be sure the plotter's wheels are locked. Keep fingers clear of the cutting path. Keep knife away from children.

- 3 Using the knife located on the back of the plotter, cut off the first few inches of the media.
- 4 Retract the blade and return the knife to its pocket.

The leading edge of media must be straight to ensure successful loading of roll media.



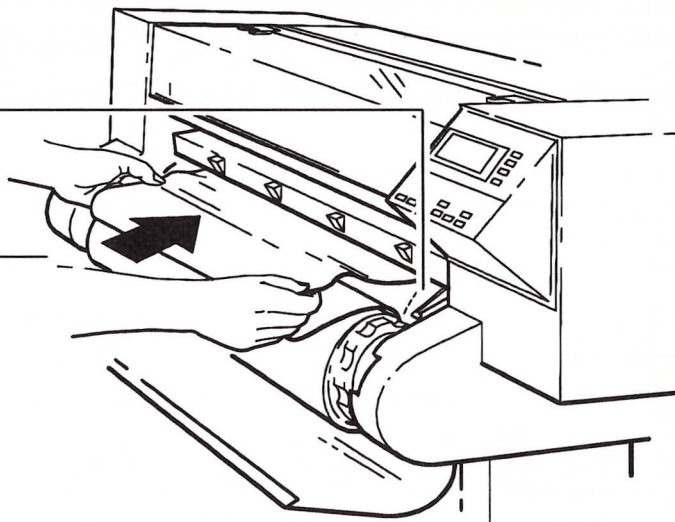
To load roll media

- 1 Check the leading edge as it unwinds from the spool. If it is uneven, refer to “To trim a ragged edge from roll media.”
- 2 Pull the media up and, holding it from the sides, align the right edge of the media with the perforated line (on the entry platen).
- 3 Insert the leading edge into the plotter until the page buckles slightly. Let go of the media when the plotter begins to pull it in.
- 4 Press ↓ next to the display window to indicate you are loading roll media.
- 5 Scroll until the display shows the type of media you are loading, (e.g., Special paper [for color plots], vellum, film, etc.) then press the **Enter** button.
- 6 When the front panel instructs you, raise the media lever.
- 7 When “Pull ↓ / Align ↔ edges to roll” displays, pull the left and right edges of the roll toward you until taut. Then align the left and right edges of the media so that they are flush with the left and right edges of the roll. When the front panel instructs you, lower the lever.
- 8 When the plotter instructs you to close the roll cover, rewind the media stop to take up any slack in the roll, make sure the leading edge of the media is outside the roll cover, then close the roll cover.
- 9 Press ↓ to continue. The plotter trims off the first few inches of media.
- 10 Select the appropriate plotting mode and print quality you want for your plot (refer to “Using the plotting mode buttons” in chapter 1 of the manual *Using the front panel*).

When media loading is complete, the “STATUS Ready to plot” displays.

Align media with
perforation.

Insert media until it
buckles slightly.



Sheet load----->

Roll load----->



Press ↓ to indicate you are loading roll media.

SELECT MEDIA

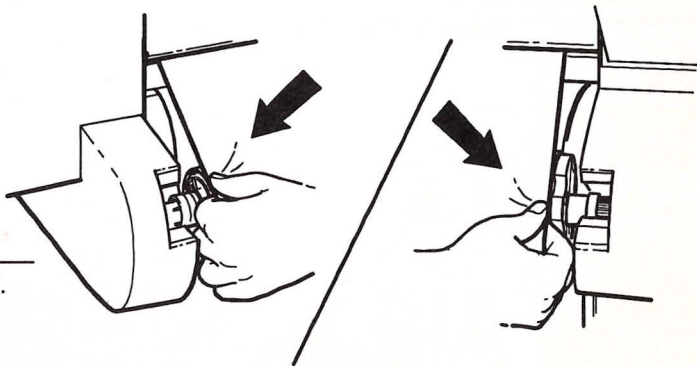
Special paper



Scroll until your media type displays, then press
Enter.

Pull ↓ / Align ↔
edges to roll

Pull the media down and align it to the roll.

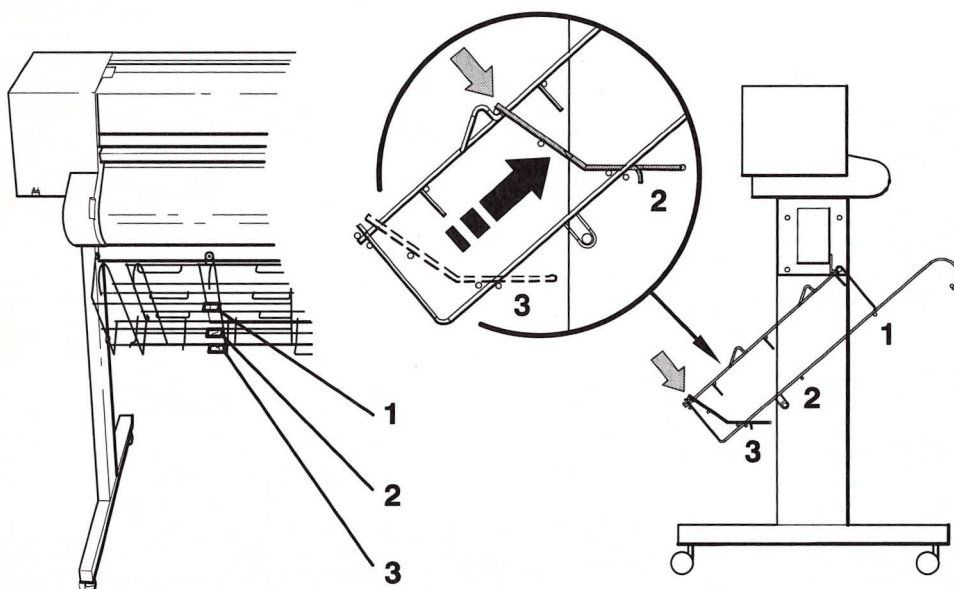


To adjust the media bin

- 1 Determine the largest plot size you will be sending and refer to the table below for the bin setting you want to use.
- 2 Pull the handle up or down and rest the hooks over the bar for the setting you want.

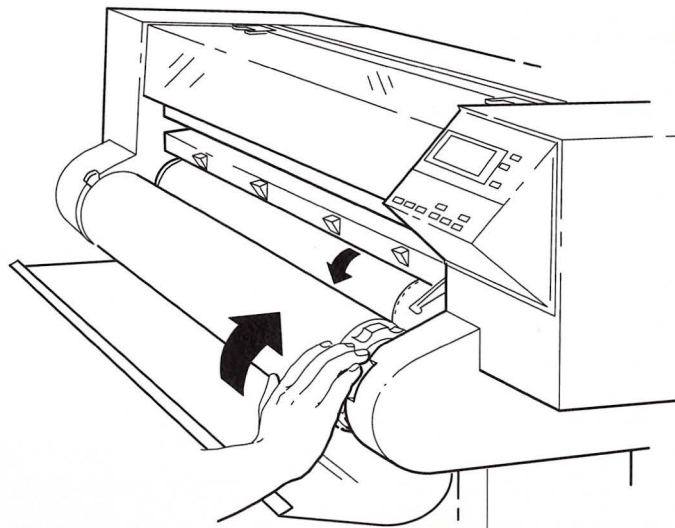
The tabs on the left side of the bin mark the adjustment bars for these settings. If plotted media is not stacking properly, place a sheet of scrap paper in the bin that is at least equal to the plot size you are creating.

Bin setting	1	2	3
Plot length	558 to 609 mm (22" to 24")	838 to 965 mm (33" to 38")	838 to 1295 mm (38" to 51")



To unload roll media

- 1 Lift the media lever to release the media.
- 2 Open the roll cover and turn the notched media stop to wind the media onto the roll.
- 3 Close the roll cover.
- 4 Lower the media lever.



To load sheet media

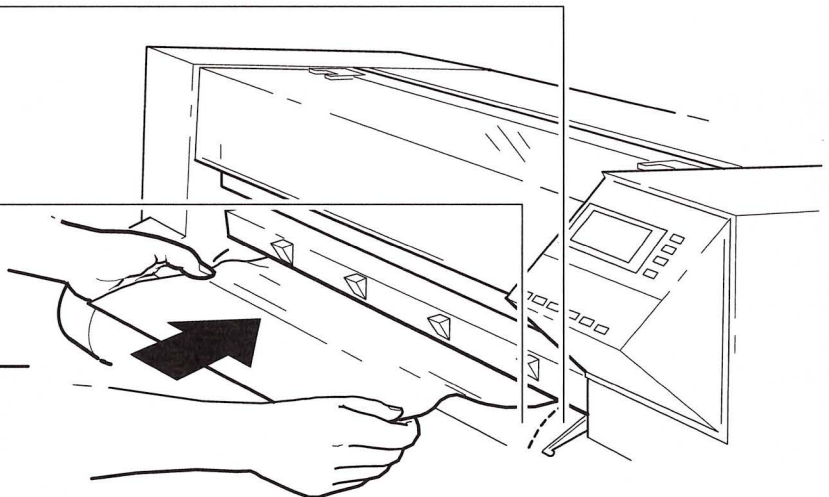
- 1 Make sure the media lever is down and the roll cover is closed.
- 2 Holding the media from the sides, align the right edge with the perforated line on the entry platen.
- 3 Insert the media until it buckles slightly. Let go of the media when the plotter begins to pull it in.
- 4 Press \uparrow next to the display window to indicate you are loading sheet media.
- 5 Scroll until your media type displays and press the **Enter** button.
- 6 Select the appropriate plotting mode and print quality you want for your plot (refer to “Using the plotting mode buttons” in chapter 1 of the manual *Using the front panel*).

The plotter pulls the sheet in and out to check its size and alignment, then advances it to the start of the page. When sheet loading is complete, the “STATUS Ready to plot” displays.

Lower media lever.

Align media with perforation.

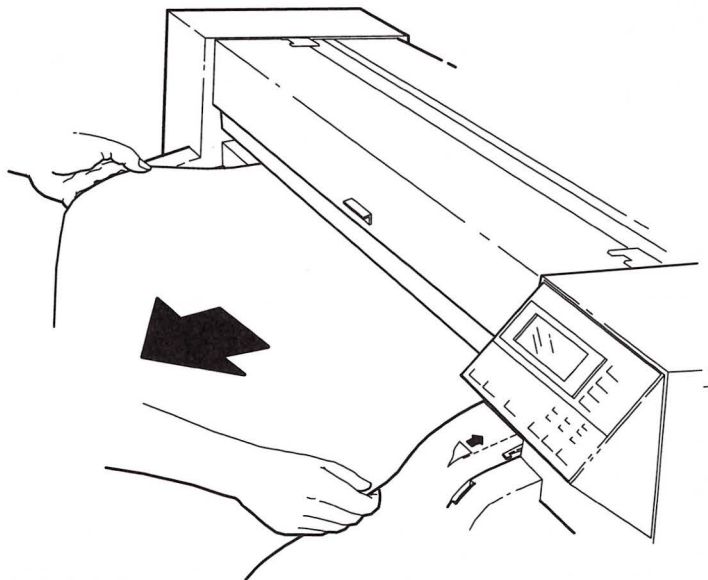
Insert media until it buckles slightly.



To remove sheet media

- To remove a plot after the plotter's dry time has finished, gently pull the media from the plotter.
- To remove a plot before the plotter's dry time has finished, lift the media lever and carefully remove the sheet so you do not smear ink inside the plotter or stain your clothing. Lower the lever.
- To remove an *unplotted* sheet, press **Form Feed/Cut**, then pull out the sheet when the plotter is finished feeding it out.
- Or lift the media lever, pull out the sheet and lower the lever.

We recommend that you let the ink dry before you remove the plot. This prevents smearing. Change the ink-drying time using the Plotter setup menu (refer to chapter 5 of the manual *Using the Front Panel*).



To clear a media jam

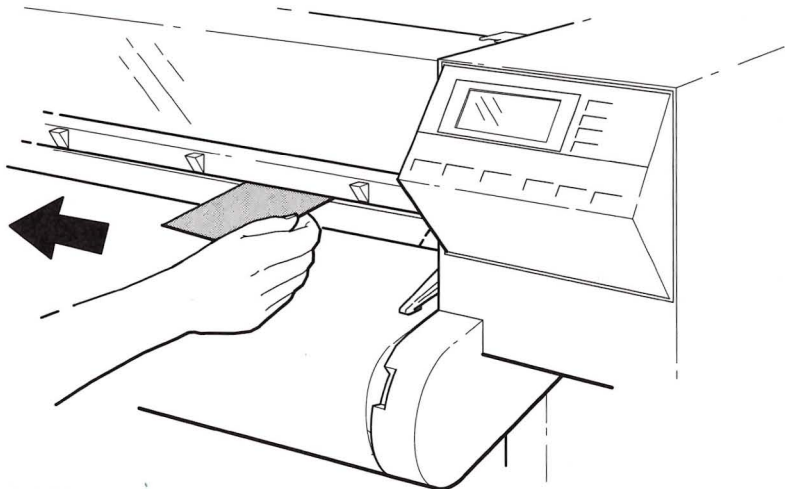
- 1 Turn off the plotter, raise the window and the media loading lever.

WARNING

Be careful when reaching inside the plotter; some parts have sharp edges. Don't touch the stainless steel strip behind the pen carriage warning stripes; it is very sharp.

Keep hair, jewelry, clothing, and foreign objects away from the plotter mechanisms.

- 2 Push the pen carriage away from the jammed media if necessary. Touch only the solid plastic parts of the carriage.
- 3 If the plotter was cutting media when the jam occurred, push the cutting carriage to the right as far as it will go.
- 4 Carefully remove the jammed media.
- 5 If media is still stuck in the media loading slot, slide a small, thin piece of cardboard along the entire length of the platen.
- 6 Lower the window and the lever and turn on the plotter. Press the **Form Feed/Cut** button to eject any pieces of media that are still in the media path.



Replacing pens

Replacing pens

When to replace pens

Always replace or reseal pens while the plotter is on. Replace the pens at the following times.

- The plotter prompts you to replace one or more pens. If `Plotter setup/Pen check` is *on*, the plotter checks if any pens need to be replaced when you turn on the plotter and at the beginning of each plot. Refer to chapter 5 of the manual *Using the Front Panel* for turning on or off the pen check feature.
- The ink-level indicator on the front of the pen is black.
- Poor plot quality indicates the pens are out of ink.
- When you are troubleshooting plot quality problems.

If the plotter prompts you to replace the pen, but the ink-level indicator on the pen is not black, the pen may only need to be reseated in the pen carriage. The electrical contacts on the pen are not making the necessary connection in the pen slot.

CAUTION

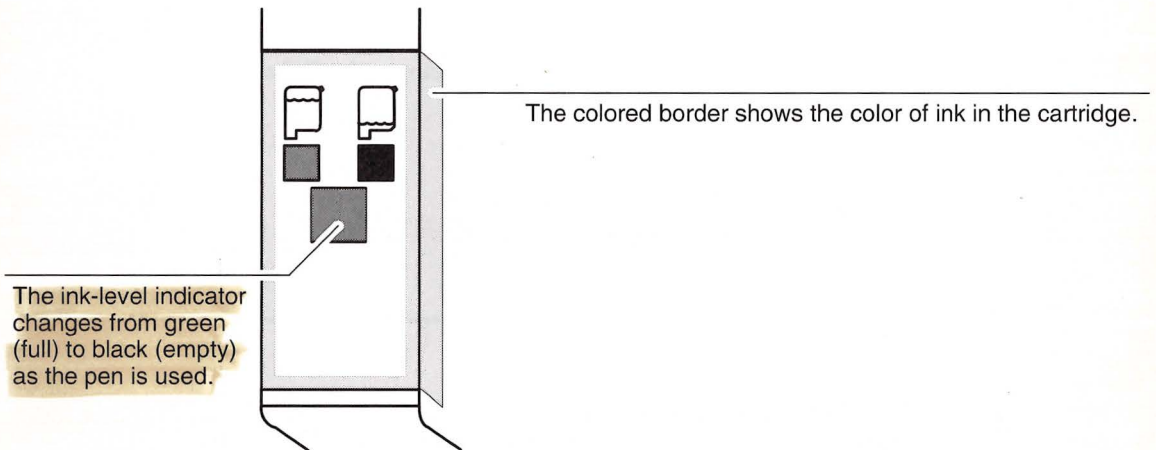
Touch only the plastic parts of the pen. Do not touch, wipe, or attempt to clean the pen nozzles or contacts; this will clog and damage the pen.

Note that each time you access the pens for loading or reseating the pen nozzles are exposed to the air. If the pen nozzles are exposed to the air (except during plotting) for more than a few minutes at a time, they are susceptible to clogging and drying.

Using pens

You can operate the plotter with only the black pen loaded. Otherwise, all pens must be loaded. You cannot insert a black pen into a color pen slot, but you must be careful to match the color borders on the pen label with the dot on the pen carriage to get the appropriate colors on your plot.

You can visually check the amount of ink in each cartridge by looking at the ink-level indicator on the front of the pen. As ink is dispensed from the cartridge, the ink-level indicator gradually changes from green to black. The ink-level indicator is only an approximation of the amount of ink left in the cartridge.



Always load HP special inkjet paper when you load or reseal pens. The plotter automatically aligns the pens whenever you insert a pen in the pen carriage. You must load HP special media to make sure that internal plotter parts aren't damaged.

Replacing pens

Loading pens

To load pens

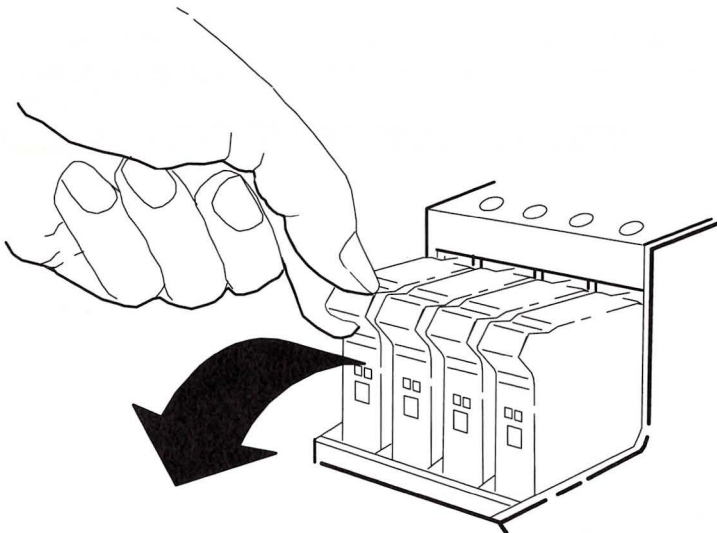
- 1 Press the **Access Pens** button and wait for the pen carriage to come to a complete stop next to the front panel. (If you are responding to a "Service pens" request, begin with step 2.)
- 2 When the pen carriage stops, open the window.
- 3 Refer to the display to see which pen to replace.

WARNING

Don't touch the stainless steel strip behind the pen carriage warning stripes; its edge is very sharp.

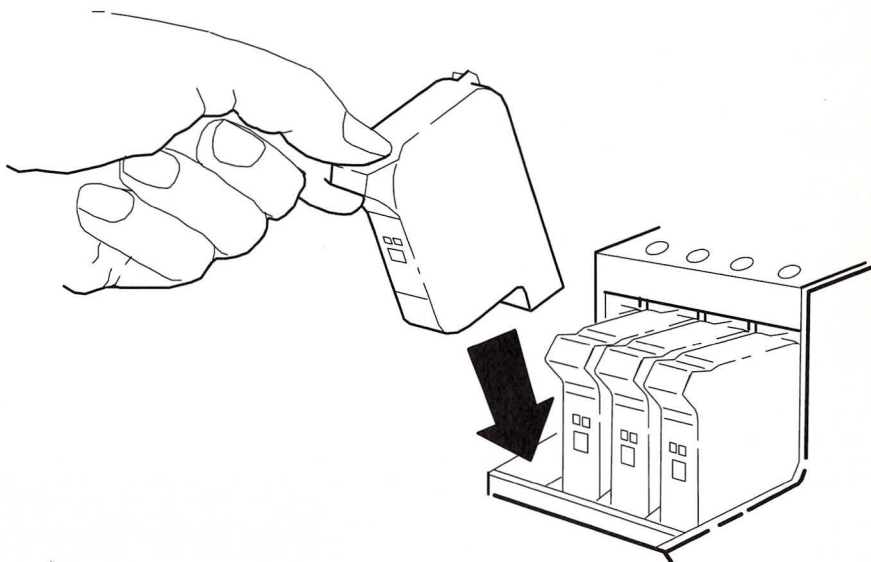
Keep hair, jewelry, clothing, and foreign objects away from the plotter mechanisms.

- 4 Press down slightly on the pen you are replacing and pull the pen toward you. Remove the pen from its slot and discard it.



- 5 Remove a new pen from its box and remove the colored protective tape and tab.
- 6 Insert the new pen into the empty pen slot.
- 7 Press down slightly and push the pen away from you until it snaps into the pen slot.
- 8 Repeat steps 3 through 7 for each pen you are replacing, then lower the window.
- 9 Load HP special inkjet paper so the plotter can create a test pattern to properly align the pens without damaging internal plotter parts.

The plotter automatically aligns pens whenever one is inserted into the pen carriage. You must load HP special media for this procedure—the plotter will use all of the pens. Do **not** open the window while the alignment is in process; otherwise the plotter restarts the alignment from the beginning.



Solving problems and
caring for the plotter

Solving problems

This chapter will help you correct some of the most common problems that can occur in the day-to-day operation of the plotter.

- If the problem has no obvious cause, refer to “Locating the source of your problem”.
- If you can narrow the problem to a certain area, refer to that chapter in the manual for the step-by-step procedures. If the problem persists, refer to the appropriate section in this chapter (for example, “Solving media handling problems”).
- If you don’t know where your problem lies, check the “Miscellaneous troubleshooting” section in this chapter.

For solving problems that are related to the front panel buttons or menus, refer to *Using the Front Panel*.

Locating the source of your problem

1 Test the plotter.

- Turn off the plotter and check that the power cord is firmly inserted in the plotter and plugged in to an outlet that you know works.
- Turn on the plotter and print one of the plotter's demonstration plots. If the plotter produces the plot correctly, the problem is probably not with your plotter.

2 Test your computer hardware and interface (refer to "Connecting and optimizing your plotter").

- Check that you are using the correct interface cable between the computer and plotter and that it is firmly connected to the proper ports.
- Refer to "Establish communication with your computer." If this verification example works, the problem is probably not with your hardware or interface.

If the program doesn't work, check that the I/O setup menu settings match the requirements of your hardware.

3 Check your software.

- Make sure the interface settings in the Plotter Setup menu match the settings and requirements of your software.

4 Check your pens.

- Load new pens and HP special inkjet paper, then print the configuration plot (Utilities/Config plot).

Solving media handling problems

The following paragraphs describe problems that are related to media handling. Refer to chapter 1 of this manual for standard media handling procedures.

Media loading problems

If the front panel keeps telling you media is misaligned or mispositioned.

- **Sheet media** Unload media and reload so that the left/right edges are even, the leading edge is straight (cut if necessary), and the right edge is no more than 0.5 cm (0.2 inches) from either side of the perforated line on the entry platen.
- Use this alternative method of loading sheet or roll media.
 - 1 Raise the window.
 - 2 Insert the media along the perforated line on the platen.
 - 3 Push in the media until it stops. Push in so that the media buckles slightly.
 - 4 Hold the media with one hand and lower the window with the other.
 - 5 Once you feel the plotter grab the media, let go of the media.
 - 6 Refer to the front panel and follow normal media loading procedures.
- If you cannot make your media's leading edge straight, as a last resort, turn on the media bypass feature (Plotter setup/Media bypass).
- **Roll media** Check the following.
 - Media stops are in place.
 - Media loads over the roll toward you.
 - Media is aligned with the perforated line on the platen.

If media crumples when you load it

- Clear any obstructions in the media path.
- When loading, push media *evenly* against the rear stops and let go when the plotter begins to pull the media in.
- Be sure the leading edge is straight and free of tears. Cut a straight edge with the knife if necessary.
- If your media is curled, load it with the curl up. Two exceptions are film and HP special inkjet paper: Load film with the plotting side (matte side) down; load HP special inkjet paper with the plotting side (coated side) down.
- When loading media, hold each edge and push the media into the plotter against the stops until a slight buckle develops evenly across the media. Let go as soon as it starts to feed into the plotter.
- If you have just moved the plotter or your media from an environment with a different humidity, let the media stabilize for at least 15 minutes before loading it.
- **Roll mode** Open the roll cover and raise the lever. Unload the leading edge of the roll. Push the media all the way to the right so that it is flush against the media stop on the roll core. Then reload the media.

If plots are not fed out properly

- Be sure the roll cover is completely closed before you plot.

Automatic cutter
problems

If the automatic cutter does not cut immediately after a plot is finished

- Check the *Page format/Margins* setting. When the margins are set to *Expand*, the plotter waits until the next plot begins plotting so it can create a 10 mm margin between both plots or nests.
- Press the **Form Feed/Cut** button if you need to cut the media before the ink-drying time has passed or before the next plot begins plotting. Use caution to avoid smearing the ink.
- Check the ink-drying time and change if necessary (Plotter setup/Dry time).

Media handling

If the automatic cutter does not work

- The automatic cutter is activated only when roll media is loaded.
- Your software application may have disabled the automatic cutter. Refer to your software documentation or contact your software vendor for more information.

If plots fall on the floor after being cut

- Adjust the bin for the length of your plots. The larger the plot, the higher the bin setting number you should use. Refer to chapter 1.
- Do not let more than twenty plots accumulate in the bin.
- Be sure you have loaded roll media properly. If loaded incorrectly, the natural curl of the media will miss the bin and fall to the floor.

If plots are not stacking properly in the bin

- If plotted media is sagging or wrinkling between the bin wires after it is cut and fed out, try placing a sheet of scrap paper in the bin shelf that is at least the size of the plot.
 - Adjust the bin for the media length you are using.
 - Load a new roll or remove plots manually as they are completed. You may be too close to the end of the roll. The natural curl near the end of the roll can cause stacking problems.
 - If you are mixing plots or nests of several different sizes, you are more likely to have stacking problems.
-

Solving pen problems

If ink smears after you remove a plot

- Be sure the ink is dry first. Check the ink-drying times (Plotter setup/Dry time). Increase the dry time, if necessary.
- Select the proper media type (when loading media) and use the front panel **Print Quality** setting for the media you are using.
- Use and store the plotter in an area where the relative humidity is no greater than 80%.
- Handle media by the edges. If possible, wear gloves when you handle film. Skin oils can interact with ink and cause it to smear.
- For optimum print quality, we recommend that the operating environment not exceed the range of 15–30°C (59–86°F) with 20-80% relative humidity.

If the **Access Pens** button does not work

- Make sure the window is closed before you press **Access Pens**.

If the plotter performs pen alignment unexpectedly

- The plotter performs the pen alignment every time you insert pens, whether they are new or not. Do not remove the pens unless they are out of ink.

You can stop the alignment by pressing **Cancel**, but the plotter will restart the alignment procedure the next time you try to plot.

If brand new pens have problems

- Check the pens to be sure you have removed all of the tape.
- Try reseating or cleaning the pens. Refer to chapter 2 for reseating and cleaning instructions.

Solving plot quality problems

Plot appearance problems

If the plot is completely blank

- Check the pens to be sure you have removed all of the protective tape.
- Your pens may be out of ink. Replace pens.

If the plotter produces a monochrome plot when you expected a color plot

- Check the front panel **Color/Mono** setting.

If the plot's appearance is not what you expected

- Check the front panel **Print Quality** setting.
- Check the **Page format/Rotate, Mirroring, and Margins** settings to be sure they are as you want them. If they conflict with the commands you have set in your software, change them so that they are compatible.
- Check your pen width and shading settings for the palette you are using.
- Check the **Pen settings/Merge control** setting.
- Ask your software vendor about any software driver or program limitations.

If your output contains only a partial plot

- **HP 7586B drivers only** Your Timeout setting may be too low (Plotter setup/Lang) . Increase the setting and plot again.
- **HP 7586B drivers only** You may have pressed the **Form Feed/Cut** button before all data was received by the plotter. Send the plot again.
- Check to make sure that your software settings are correct for your current plot size (e.g., long-axis plots).
- If you are using network software, make sure it has not timed out.

If a plot overlays another plot on the page

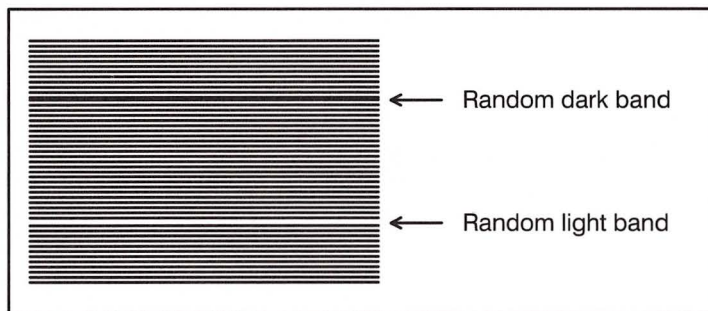
- If you have set **Plotter setup/Lang** to 7586, HP-GL/2, change the **Timeout** or **Terminator** settings and send the files again.

If vertical lines on the plot look jagged

- Either turn off and on the plotter or remove and reinsert a pen to force the plotter to run the pen alignment procedure (use HP special inkjet paper).
- Check that you specified the correct media type when you loaded media (**Utilities/Statistics/Media**).
- If none of the above suggestions work, try replacing the pens.

If area fills on plots have random dark or light bands

- Change the print quality to **Final** or **Enhanced**.
- Either turn off and on the plotter or remove and reinsert a pen to force the plotter to run the pen alignment procedure (use HP special inkjet paper).
- Run the accuracy calibration procedure (**Utilities/Accuracy**).
- If none of the above suggestions seem to work, try replacing the pens.



Solving problems and caring for the plotter

Plot quality

If area fills on plots have pronounced banding

(Some banding is normal, especially in dark or dense area fills.)

- Either turn off and on the plotter or remove and reinsert a pen to force the plotter to run the pen alignment procedure (use HP special inkjet paper).
- Replace the pens.

If ink on the plot looks “blotchy” or has uneven ink density

- For color plots, be sure you are using HP special inkjet paper.
- For monochrome plots, try another brand of media.
- If using film, use only Hewlett-Packard polyester inkjet film.

If lines bleed or appear fuzzy (black monochrome plots)

- If you are plotting on vellum or translucent media (monochrome plots), try using Hewlett-Packard plotter media.
- The temperature and humidity may be too high. For optimum print quality, we recommend that the operating environment not exceed the range of 15–30°C (59–86°F) with 20–80% relative humidity.

If plots are not accurate

- If you notice problems with accuracy, recalibrate the plotter’s accuracy (Utilities/Accuracy).

If the output is distorted or unintelligible

- Make sure the interface settings in the I/O setup menu match the settings and requirements of your software and hardware.

If the entire plot is placed in one quarter of the plotting area

- If your application’s driver was written for HP-GL/2, try switching the graphics language setting between “7586, HP-GL/2” to “HP-GL/2” (Plotter setup/Lang).

Plot accuracy
problems

Plot location
problems

Solving front panel problems

If the **Access Pens** button does not work

- Make sure the window is closed before you press **Access Pens**.

If none of the front panel buttons work

- Turn the plotter off and then on again. If the problem persists, have your plotter serviced.

If **Page format/Rotate** does not work

- Your plot file may be too big for the plotter's buffer. If you install additional memory, your entire plot can fit into the plotter's buffer.
- The plotter cannot rotate raster images. If your plots contain raster data (typically, images with heavy area fill and shading that you have scanned into your software) you will not be able to rotate the plot.

If the front panel says the roll is misaligned or mispositioned

- Unload media, open the roll cover, and push the media roll all the way to the right so that it is flush against the media stop on the roll core. Reload media with the right edge no more than 0.5 cm (0.2 inches) from either side of the perforated line on the entry platen and make sure the left/right media edges are even with the left/right roll core edges.

If a display message will not clear

- Look up the message in the list of state, action, and error messages in the "Reference" chapter at the end of this manual. The message description may help you understand and resolve the problem.
- If looking up the message did not help, press **Enter**. If that does not work, turn the power off, then on again. If the message still displays, have the plotter serviced. If the message says "System error" and has an alphanumeric code, refer to the next explanation.

Front panel

If a “System error” message is displayed

- Press **Enter**. If the message does not clear, turn the plotter off, then on again to try to clear the error message. If media appears to be jammed, clear it. If the message still displays, record the alphanumeric code and have the plotter serviced. Report the code to the service technician; knowing the code number will help the technician resolve the problem.

If you get an “Out of memory/Data was lost” message

- The current plot is too large for the plotter’s buffer. To do this plot you will have to install additional memory.

Miscellaneous troubleshooting

If the plotter does not plot

- If you are sure all plot data has been sent, press the **Form Feed/Cut** button to end any Timeout period and force plotting to start.
- If nothing happens after trying the above, you might have a problem with your application driver. If your driver was written for HP-GL/2, try changing the graphics language mode to "HP-GL/2" (Plotter setup/Lang).
- If you continue to have problems, contact your software vendor.

If the bail does not lower all the way

- Check for obstructions under the bail (the black bar just inside the plotter's window).
- Make sure the cutting carriage is pushed all the way to the right.

If the plotter waits too long to plot a nest

- Change the Plot mgmt/Nest=(*Optimal or In order*)/Nest wait setting.

If the plotter performs pen alignment unexpectedly

- The plotter aligns the pens every time you insert pens, whether or not the pens are new. This is a normal plotter operation.

If the plotter seems too slow

- Check that the front panel **print quality** setting is appropriate.

Caring for the plotter

Maintenance and repairs beyond cleaning the plotter should be performed by a service technician. Plotter care is limited to cleaning the outside of the machine. Use a damp sponge or soft cloth and household cleaner.

WARNING

To avoid electrical shock, unplug the plotter before you clean it. Do not let water get inside the plotter.

CAUTION

Do not use abrasive cleaners on the plotter.

Getting help

Hewlett-Packard has support services available to help you in case you have a problem with your plotter. Following are suggestions of places to turn for this support.

Before you call for customer support, make sure you do the following.

- 1** Review the troubleshooting suggestions in this chapter.
- 2** Run one of the plotter's internal demonstration plots. If the demonstration plot works, the problem is probably not with your plotter.
- 3** Check with your software vendor for help.

If you still have difficulty, begin by contacting the person from whom you purchased your plotter. Your sales representative is familiar with your needs, equipment, and software and should be able to provide you with the information you want.

If you do not get the answers to your questions from your dealer or sales representative, Hewlett-Packard has a Customer Assist service available to you. The Assist staff can help by answering questions on topics such as setting up your plotter and computer, and can help you find third party software solutions for your special plotting needs.

Getting help

When you call the HP Customer Support Center, please have the following information available to help us answer your questions more quickly.

- Identify what computer you are using.

- Identify any special equipment or software you are using (for example, spoolers, networks, switch-boxes, modems, or special software drivers).

- Identify what cable you are using (by part number) and where you purchased it.

- Identify the type of interface used on your plotter (RS-232-C, parallel, or modular).

- Identify the software name and version you are currently using.

The HP Customer Support Center is available in the U.S. at the following times: Monday, Tuesday, Thursday, and Friday from 7 a.m.–6 p.m. (Mountain Standard Time); Wednesday from 7 a.m.–4 p.m. (Mountain Standard Time).

(208) 323–2551

If a repair is needed, contact the Hewlett-Packard dealer or HP Sales and Support Office where you purchased the plotter for complete service information.

Section 2

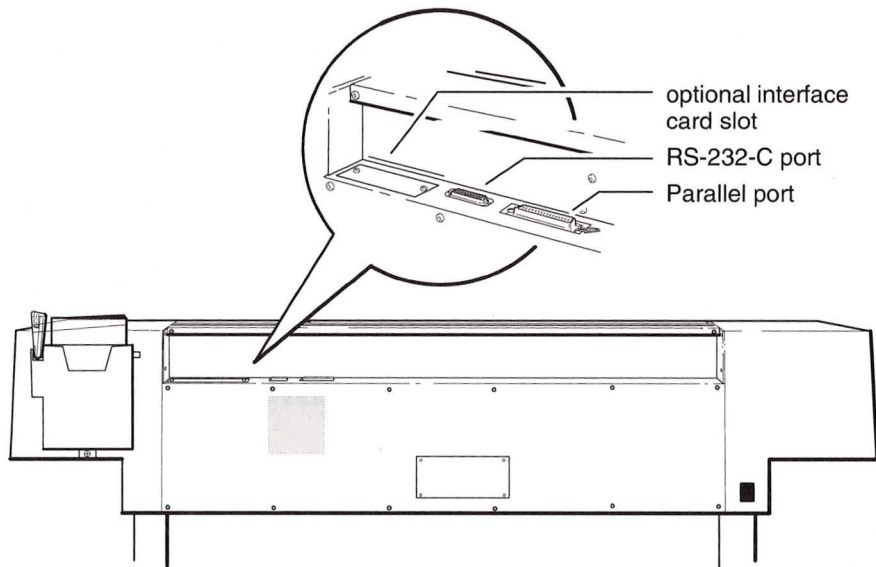
Connecting and enhancing your
plotter

Connecting and enhancing your plotter

In this section, you will connect your plotter to your computer (chapter 1) and, if necessary, make some adjustments in your front panel options and optionally install additional plotter memory or enhancement cards you might have purchased for your plotter (chapter 2).

Preparing to connect your plotter to a computer

Your plotter supports several types of connections: Centronics parallel, serial (RS-232-C), and connection through an optional interface card (such as the HP JetDirect card). If your computer and software support it, use the Centronics parallel interface or a network connection (using an optional interface card) for faster file transmission.



Optional interface card users only:
Install the card

If you have purchased an optional interface card such as the HP JetDirect Card, your card's documentation includes cabling information. Install the card and configure it (if necessary) as directed in the card's documentation.

The optional card provides connectivity to different computer environments. Depending on your needs, you may want to use this card *instead of or in addition to* the RS-232-C and Centronics parallel interfaces.

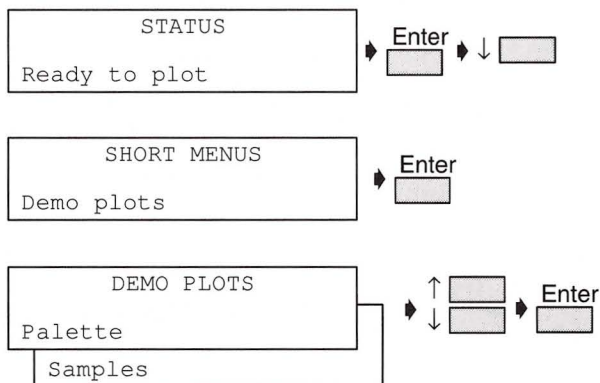
Your sales representative has information on HP JetDirect cards available for use with this plotter.

Before you connect your plotter to a computer, we recommend you print one of the demonstration plots. This ensures that the plotter is operating properly before connecting it to a computer.

Print a demonstration plot

- 1 Load HP special inkjet paper and pens (refer to previous instructions).
- 2 From the **Status** screen, press **Enter**.
- 3 Press **↓** to scroll to **Demo plots**, then press **Enter**.
- 4 Scroll to any of the demo plots listed and press **Enter**.

The **Busy** light on the plotter flashes to indicate the internal plot is being loaded. After plotting, the plotter continues to hold the plot until the ink is dry, then (if roll media is loaded) drops it into the media bin.



Connecting your plotter to a computer

Choose an interface cable

Choose an interface cable

Decide on the type of interface (parallel or serial) you want to use, then refer to the table to make sure you have the correct cable. If you don't see your computer in this table, check your computer hardware documentation for cabling information.

Use shielded interface cables only. This minimizes electromagnetic interference and meets regulated standards.

Cable interface	Computer	Cable length	HP Part Number
Centronics Parallel	HP Vectra ¹	2.1 m (6.9 ft)	92284A
	IBM AT IBM PS/2 IBM PC/XT and compatibles HP 9000/7xx workstations		
RS-232-C	IBM PC/XT	1.2 m (3.9 ft)	17255D
	IBM PS/2 and compatibles		
	IBM AT and compatibles ²	3.0 m (9.8 ft)	24542G
	HP Vectra ³		
	HP 9000/7xx workstations ²	3.0 m (9.8 ft)	24542G
	DEC VAX ⁴	3.0 m (9.8 ft)	17355M
	HP Vectra ⁵	1.2 m (3.9 ft)	17255M
	Sun workstation HP Apollo workstation ⁶ DEC VAX		
	Apple Macintosh Plus, SE, II	1.5 m (4.9 ft)	17302A

¹ Using an HP 24540A/B serial/parallel interface card, using the parallel connector

² Using a 9-pin serial connector

³ Using an HP 24540A/B serial/parallel interface card or HP 24541A/B dual serial interface card, using the 9-pin connector

⁴ Using DEC BC22D, BC03M, or equivalent

⁵ Using an HP 24541A/B dual serial interface card, using the 25-pin connector

⁶ Using an SPE (Serial/Parallel Expansion) option and supplied adapter cable

Connect the plotter to your computer

- 1 Turn off the plotter and computer.
- 2 Connect one end of the cable to the proper interface port on the back of the plotter. (Each port is labeled.)
- 3 Connect the other end of the cable to the computer port. (Check your computer documentation to find the proper port if necessary.) Latch or screw the cable into place.

CAUTION

Make sure the cable is plugged into the proper port on your equipment. You can damage a port with an improper connection.

- 4 Turn on the plotter and computer. Note that the plotter automatically scans the ports for incoming data. You do not need to turn off the plotter and turn it on again to activate a different port.

If you're using only the parallel (Centronics) interface, continue with "Establish communication with your plotter" now.

Choose an interface cable

Choose an interface cable

Decide on the type of interface (parallel or serial) you want to use, then refer to the table to make sure you have the correct cable. If you don't see your computer in this table, check your computer hardware documentation for cabling information.

Use shielded interface cables only. This minimizes electromagnetic interference and meets regulated standards.

Cable interface	Computer	Cable length	HP Part Number
Centronics Parallel	HP Vectra ¹	2.1 m (6.9 ft)	92284A
	IBM AT		
	IBM PS/2		
	IBM PC/XT and compatibles		
	HP 9000/7xx workstations		
RS-232-C	IBM PC/XT	1.2 m (3.9 ft)	17255D
	IBM PS/2 and compatibles		
	IBM AT and compatibles ²	3.0 m (9.8 ft)	24542G
	HP Vectra ³		
	HP 9000/7xx workstations ²	3.0 m (9.8 ft)	24542G
	DEC VAX ⁴	3.0 m (9.8 ft)	17355M
	HP Vectra ⁵	1.2 m (3.9 ft)	17255M
	Sun workstation		
	HP Apollo workstation ⁶		
	DEC VAX		
	Apple Macintosh Plus, SE, II	1.5 m (4.9 ft)	17302A

¹ Using an HP 24540A/B serial/parallel interface card, using the parallel connector

² Using a 9-pin serial connector

³ Using an HP 24540A/B serial/parallel interface card or HP 24541A/B dual serial interface card, using the 9-pin connector

⁴ Using DEC BC22D, BC03M, or equivalent

⁵ Using an HP 24541A/B dual serial interface card, using the 25-pin connector

⁶ Using an SPE (Serial/Parallel Expansion) option and supplied adapter cable

Connect the plotter to your computer

- 1** Turn off the plotter and computer.
- 2** Connect one end of the cable to the proper interface port on the back of the plotter. (Each port is labeled.)
- 3** Connect the other end of the cable to the computer port. (Check your computer documentation to find the proper port if necessary.) Latch or screw the cable into place.

CAUTION

Make sure the cable is plugged into the proper port on your equipment. You can damage a port with an improper connection.

- 4** Turn on the plotter and computer. Note that the plotter automatically scans the ports for incoming data. You do not need to turn off the plotter and turn it on again to activate a different port.

If you're using only the parallel (Centronics) interface, continue with "Establish communication with your plotter" now.

Set up the serial interface (RS-232-C users only)

The following is for users connecting an RS-232-C cable to their computer and plotter. If you are using the parallel interface, you do not need to configure the plotter (continue with “Establish communication with your plotter” later in this section).

Compare your system information with the plotter defaults

The plotter is shipped with the following serial interface settings.

- Baud rate=9600
- Handshake=Both (hardwire and Xon/Xoff)
- Parity=None (0)

If the settings above *already match* your computer and software configuration, continue with “Configure your computer’s serial port.”

If the settings above are *not* the same as those required by your computer and software configuration, you need to do the following procedures (described in detail on the following pages).

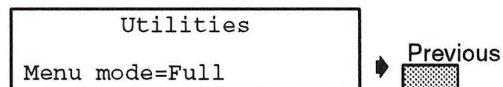
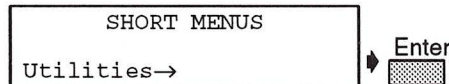
- Change the front panel menu mode to the *full* menu.
- Define a serial configuration using the plotter’s front panel (i.e., change the baud rate, handshake, and/or parity).
- Designate that configuration as the one you want the plotter to use.
- Configure your computer’s serial port.

Switch from the short menu to the full menu

- 1 At the Status screen, press **Enter**.

The top line of the display indicates the plotter is using either *short* or *full* menus. (If the top line indicates you are using the full menu system, continue with "Change the plotter defaults" below.)

- 2 If you are using the short menu system, press ↓ twice to scroll to *Utilities*, then press **Enter**.
- 3 Press **Enter** again, then scroll to *Full* and press **Enter**. The plotter will now display all menu options as you move through the menu system.
- 4 Press **Previous** to return to the next highest level of the menu system.



Set up the serial interface

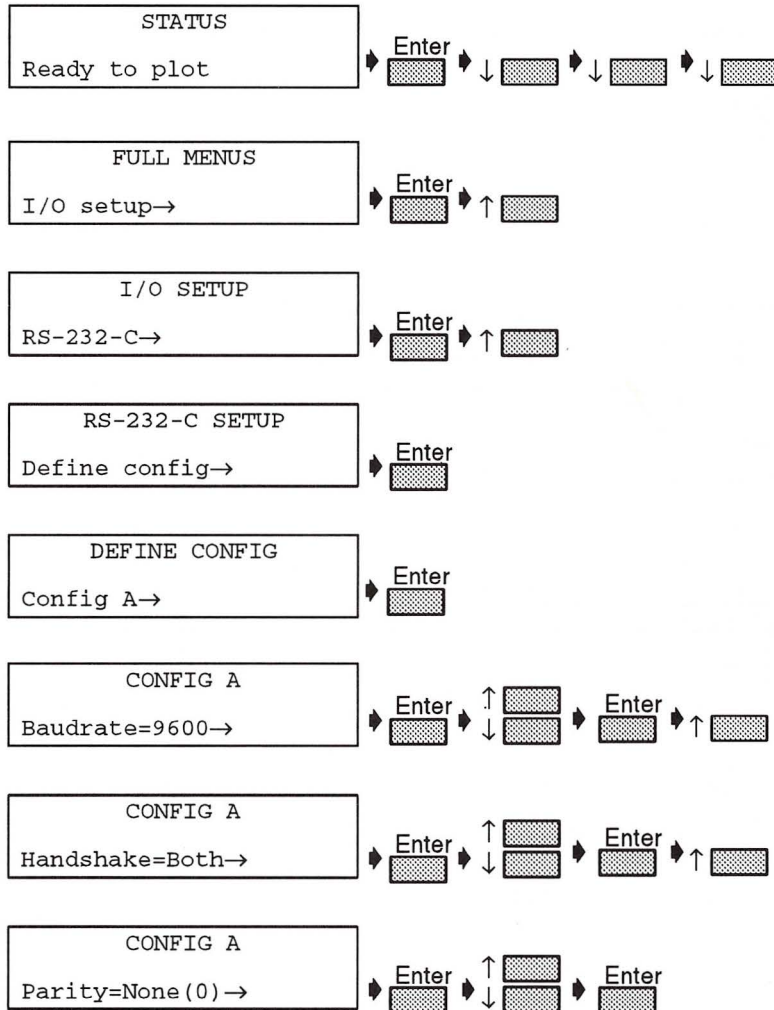
Change the plotter defaults

- 1 Press ↓ to scroll to I/O setup, then press **Enter**. (If you are at the Status screen, press **Enter**, then scroll to I/O setup and press **Enter**.)
- 2 Scroll to RS-232-C and press **Enter**.
- 3 Scroll to Define config and press **Enter**.
- 4 Use the scrolling buttons to display the configuration you want to change, then press **Enter**. (Note that you cannot change the Factory configuration, you may only view its settings for reference.)
- 5 Scroll to the configuration options (*Baudrate*, *Handshake*, and *Parity*) as necessary. When the option you want displays, press **Enter**. The plotter displays the current setting for that option.
- 6 Use the scrolling buttons to review the other choices. When the setting you want displays, press **Enter**.
- 7 Return to step 5 for each serial configuration option you want to change.

For each of the serial settings below, choose the setting that matches your computer's capabilities.

- Baud rate options are: 38400, 19200, 9600 (Default), 4800, 2400, and 1200.
- Handshake options are: Hardwire, Xon/Xoff, and Both (default).
- Parity options are: None (0), Even, Odd, And Mark. The default is *None (0)*.

The plotter saves the configuration until you define a new one.

Set up the serial interface

Set up the serial interface

Load the new configuration

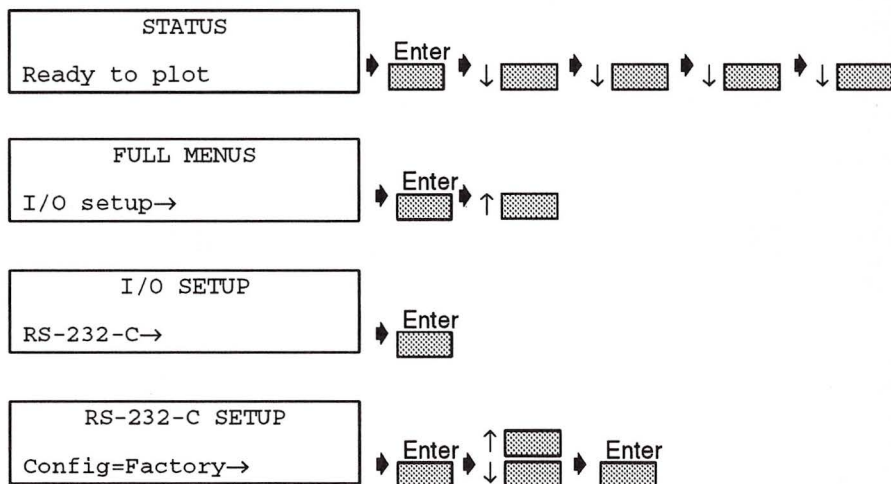
- 1 If you have just finished the previous procedure, use procedure a; if you are at the Status screen, use procedure b.
 - a Press **Previous** until Define config displays. Then scroll to Config= and press **Enter**.
 - b From the Status screen, press **Enter**. Press ↓ three times to scroll to I/O set-up, then press **Enter**. (You must be using the full menu mode; refer to the earlier instructions on switching menu modes.)

Scroll to RS-232-C and press **Enter**. The plotter displays the currently loaded serial configuration.

If necessary, scroll to Config= and press **Enter**.

- 2 Scroll until the configuration you want to use displays, then press **Enter**.

Initially, all serial configurations are the same.



Configure your computer's serial port (RS-232-C users only)

When the plotter's default settings match those of your computer and software configuration, use the following to set up your computer port for sending files using its serial port. (The following is for DOS users; if you are using UNIX®, refer to your system documentation for configuring the serial port.)

```
MODE COM1:9600,N,8,1,P
MODE LPT1:=COM1
```

(If another device is already using COM1, substitute COM2.)

If you have changed the plotter default configuration (see “Set up the serial interface” earlier in this manual), the MODE command parameters must match the settings in the configuration. Refer to your computer documentation for more information on using the MODE command.

Establish communication with your computer

Type one of the following from your DOS prompt, depending on which interface you are using. (If you are using UNIX®, refer to your system documentation for configuring the serial port.) The plotter will draw a triangle and advance the media.

```
ECHO IN;SP1;PS5000,5000PD0,1500,1500,1500,0,0PG;>LPT1
```

(Substitute LPT2 for LPT1 if you have connected the plotter to the LPT2 port. Substitute COM1 or COM2 for LPT1 if you have connected the plotter to either of those serial ports.)

Optimizing the performance of
your plotter

Optimizing the performance of your plotter

This chapter explains options or ideas you might try to enhance your plotter's queueing and nesting capabilities or to work better with your software.

Adding plotter memory

Your plotter comes with 4 MB of built-in memory for the managing of plots (queueing, nesting, etc.). You can expand this up to 20 MB of memory. Also, there may be other cards available for your plotter (such as ROM modules for plotter feature upgrades); check with your HP sales representative.

Changing the plotter's graphics language setting

The plotter's factory default graphics language mode should work for most software applications. If you are installing new software, check for the plotter's name in the list of output devices or for a device with "HP-GL/2" in the name.

If you are using an older application designed for an HP 7586B pen plotter (or another HP-GL device), send a short test file to test how the plotter reacts. If the plotter waits about two minutes after the plot transmission before plotting data or plots in one quadrant of the page, you might want to change the one or more of the graphics language settings (i.e., graphics language, timeout, or terminator).

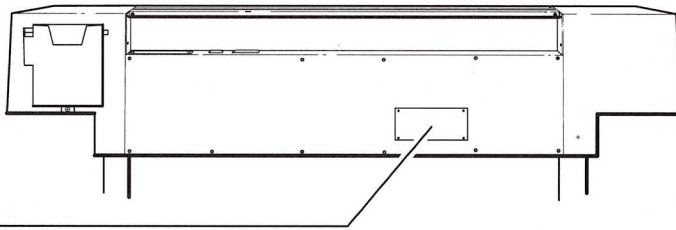
For instructions on changing the plotter's graphics language setting, refer to the manual *Using the Front Panel* (chapter 5).

To add memory or ROM modules

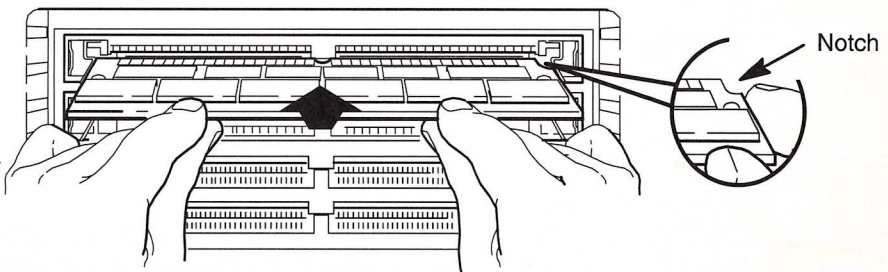
- 1 Turn off the plotter and disconnect the power cord.
- 2 Remove the cover plate on the back of the plotter. The two large slots on the top are for ROM boards (for plotter feature upgrades), the two small slots below are for plotter memory expansion boards.
- 3 Either put on a grounding wrist strap and attach the end to a good chassis ground on the plotter, or touch the outer metal surface of the plotter.
- 4 Hold the module by its edges with the nonmetallic edge toward you and the notch to your right.

When installing only one module (either ROM and/or memory board), you must place them in specific slots. Insert the individual ROM board into the highest slot. Insert the individual memory board into the lowest slot.

- 5 Tilt the nonmetallic edge down and firmly push the module into the slot. Gradually tilt the module up and push it in until it clicks into place.
- 6 Replace the cover plate and its four screws.



Remove the cover plate
to access slots.



Push in until the board
clicks into place.

Reference

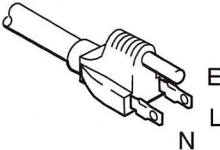
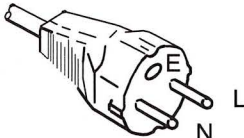
Power cords

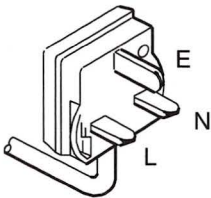
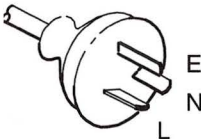
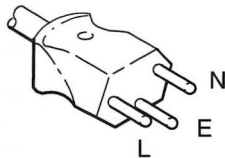
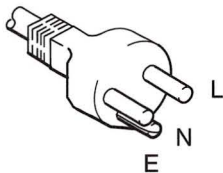

The power cord supplied with your plotter should meet the plug requirements for your area. However, different power cords (international options) are available (see below). If necessary, you can obtain a different power cable by contacting your local Hewlett-Packard Sales and Support office or authorized dealer. Note the following abbreviations used in the power cord options table below.

L – Line or Active Conductor (also called “live” or “hot”)

N – Neutral or Identified Conductor

E – Earth or Ground

AC Plug Type	AC Voltage	Country	HP Part Number
NEMA 5-15P	120 V	Canada Philippines Taiwan United States	8120-1378
	127 V	Mexico	8120-1378
	100 V	Japan	8120-4753
CEE 7-VII	220 V	Continental Europe Egypt Saudi Arabia Korea	8120-1689
			

AC Plug Type	AC Voltage	Country	HP Part Number
BS 1363A 	240 V 220 V	United Kingdom Hong Kong	8120-1351
ASC112 	220 V 240 V	China (mainland) Australia New Zealand	8120-1369
SEV 1011 	220 V	Switzerland	8120-2104
DHCR-107 	220 V	Denmark	8120-2956
	220 V 240 V	India	8120-4211

Specifications

Functional specifications

Number of pens	4
Minimum media sizes	Width (carriage path; y-axis): 210 mm (8.3") Length (paper path; x-axis), sheet only: 280 mm (11")
Maximum media sizes	Width (carriage path; y-axis): E-size plotter: 917 mm (36.1") D-size plotter: 625 mm (24.6") Length (paper path; x-axis), sheet only: 1297 mm (51")
Media types (Monochrome)	Plain paper bond Plain vellum (Hewlett-Packard preferred) Plain translucent paper (Hewlett-Packard preferred) Hewlett-Packard polyester inkjet film HP special inkjet paper
Media types (Color)	HP special inkjet paper
Maximum plotting area	Media size minus margins (Side margins= about 5 mm [0.2"], Leading/trailing edges = 17 mm [0.67"]*) Expanded margins for roll media are 10 mm on the leading and trailing edges.
Resolution (addressable)	Color plots: 300x300 dpi for all modes Monochrome plots: Enhanced:600x600 dpi Final and Draft modes: 300x300 dpi
Accuracy (Maximum accumulated error)	± 0.38 mm (0.015 inches) or $\pm 0.2\%$ of the specified vector length, whichever is greater, at 23°C (73°F), 50–60% relative humidity, on HP Inkjet 0.012-cm (0.0048-inch) polyester film

* Margins are approximate; exact values may vary by a millimeter.

Physical specifications

	C2858 (D-size)	C2859 (E-size)
Size	Length: 1079 cm (42.5") Width: 711 cm (28.0") Height: 1149 cm (45.25")	Length: 1371 cm (54.0") Width: 711 cm (28.0") Height: 1200 cm (47.25")
Weight	57.6 kg (128 lbs)	69.75 kg (155 lbs)

Environmental specifications

Operating environment	<p>Plotter: 0 to 55°C (32 to 131°F) @ 20-80% relative humidity</p> <p>With pens and media: 15 to 35°C (59 to 95°F) @ 20-80% relative humidity</p> <p>Optimal print quality: 15 to 30°C (59 to 86°F) @ 20-80% relative humidity</p>
Storage environment	<p>Plotter/media: -40 to 70°C (-40 to 158°F) @ 5-95% relative humidity</p> <p>Pen (black): -40 to 40°C (-40 to 104°F)</p> <p>Pens (color): -40 to 70°C (-40 to 158°F)</p>

Power specifications

Source	100-240V AC±10%
Frequency	47-63 Hz
Consumption	140 W (2.0 A max.)

Acoustic specifications*

Operating sound pressure	54 dB(A)
Idle sound pressure	<20 dB(A)

* These specifications are typical sound pressures at a one-meter bystander position.

Metric (ISO) Cutsheet	Size	Product #
A4	210mm x 297mm	51630Z
A3	297mm x 420mm	51631B
A1	594mm x 841mm	51631H
A0	841mm x 1189mm	51631M
English (ANSI) Cutsheet		
A	8.5 in. x 11 in.	51630Y
B	11 in. x 17 in.	51631A
D	22 in. x 34 in.	51631G
Arch. E1	30 in. x 42 in.	51631L
Roll		
	60,9cm x 45,7m 24 in. x 150 ft.	51631D
Roll		
	91,4cm x 45,7m 36 in. x 150 ft.	51631E

HP-GL/2 programming information

If you are writing an HP-GL/2 driver for your plotter, refer to *The HP-GL/2 Reference Guide* for general instruction information. For specific parameter information, refer to *The Product Comparison Guide for HP-GL/2 and HP RTL Peripherals*.

The HP-GL/2 Reference Guide (ISBN 0-201-56308-8) is published by Addison-Wesley Publishing Company and can be ordered through most book stores. *The Product Comparison Guide for HP-GL/2 and HP RTL Peripherals* (HP part number 5959-9734) can be ordered through your HP Sales office.

PJL Summary

This chapter provides an overview of the Printer Job Language (PJL) included in the plotter. The PJL commands in the plotter allow a user to enter and exit PJL mode, determine the status of the plotter and comment their PJL driver and echo commands sent to the plotter.

General PJL Rules

- All commands (except the Enter PJL Command) must begin with @PJL. PJL *must* be capitalized.
- Except for @PJL, commands are not case sensitive. This means that “ENTER”, “Enter” and “enter” are identical.
- All commands must end with either <CR><LF> or <LF>.
- The only legal characters in a value field are a horizontal tab (ASCII 9) plus ASCII characters 32 through 126.
- Only the first 256 characters of a command are recognized. Additional characters cause the entire command to be ignored.
- Values in parentheses () are optional.
- Issue <ESC>%-12345X and @PJL ENTER LANGUAGE= commands at the beginning and end of your device definition files to switch from one language format to another and back again.

PJL Summary

Enter PJL

<ESC>%-12345X

Use: Exits the current non-PJL state and enters PJL. If already in PJL, this command is ignored.

Remarks: This command performs the following actions:

- Prints all data received before this command.
- Shuts down the current language context in an orderly fashion.

Note that (<CR>)<LF> should *not* follow this command.

Enter non-PJL

@PJL ENTER LANGUAGE=# (<CR>)<LF>

Value	Meaning
HPGL2	Enter HP-GL/2 language context
PostScript	Enter PostScript language context

Default: The plotter automatically switches out of PJL and into the language context specified by the front panel setting whenever a command is not prefaced with @PJL

Range: ASCII characters 9, 32–126

Remarks: This command allows the user to exit PJL and enter another language context. It is recommended that the user exit PJL in this manner. Use the following syntax to switch into PostScript language context:

```
<ESC>%-12345X@PJL ENTER LANGUAGE=POSTSCRIPT<CR><LF>
```

Use the following syntax to switch back into HP-GL/2 language context:

```
<ESC>%-12345X@PJL ENTER LANGUAGE=HP-GL/2<CR><LF>
<ESC>%-1B
```

Echo Characters
sent to plotter

@PJT ECHO # (<CR><LF>

Use: This command causes the plotter to return the value included with the command back to the host.

Range: ASCII characters 9, 32–126. Maximum length of 256 characters. You can include up to 256 characters in the valid ASCII character range (ASCII characters 9, and 32–256).

Remarks: The response to the Echo command will be: @PJT ECHO # <CR><LF><FF>. (Where # will be made up of ASCII characters 32–126 or ASCII character 9 (horizontal tab).) Once the command string (including the value field) exceeds 256, the entire command is ignored.

Comment

@PJT COMMENT # (<CR><LF>

Use: This command allows the program to include comments in their PJT program. It has no effect on the plotter. You can include up to 256 characters in the valid ASCII character range (ASCII characters 9, and 32–256).

Unsolicited Status

@PJL USTATUS TIMED = # (<CR><LF>
@PJL USTATUS DEVICE = # (<CR><LF>

Use: The USTATUS command is used to define when the status of the plotter should be returned to the host. There are two independent modes of the unsolicited response: TIMED and DEVICE.

Note that only one of TIMED or DEVICE may be used in a single command, although both can be active at the same time.

TIMED=#

Value	Meaning
0	Disables sending of an unsolicited response set using the TIMED= command. Has no effect on the sending of unsolicited responses enabled using the DEVICE=command.
1	Command is ignored.
2–300	Enables the sending of the current status every # seconds.
>300	Command is ignored.

Default: 0 (Timed response is disabled).

Range: Integers in the range 5 to 300, inclusive. All other values (including negative values) cause the command to be ignored.

Remarks: When this command is included in the USTATUS string, it causes the plotter to send the current status every # seconds. Setting # to 0 disables the timed response, but has no effect on responses set using the DEVICE= string.

The syntax of the response from the plotter is:

```
@PJL USTATUS TIMED<CR><LF>
CODE=XXYYY<CR><LF>
<FF>
```

Where *XX* is the category and *YYY* is the error code. The tables below list the error codes and categories.

Category	Meaning
10	The response is for informational purposes only.
20	A PJL syntax error has occurred.
30	An error has occurred, but the plotter will continue to operate. No user intervention is required.
40	User intervention is required.
50	A hardware error has occurred and authorized service personnel should be called in.

Category	Code	Meaning
10	001	Ready to plot
	002	Ink drying <i>or</i> Plotting
	003	Initializing
	004	Self-Test (includes a printed self-test)
20	000	Wildcard error code. Used to return a display message to the controller
	001	Syntax error
	002	Unsupported/Invalid command
	003	Unsupported/Invalid option
	004	Unsupported/Invalid personality/system
	005	PJL command buffer overflow
30	006	Invalid
	001	Cancelling
	003	Modular interface error <i>or</i> RS-232-C communication error

PJL Summary

Category	Code	Meaning
40	001	Lower lever <i>or</i> Lower cover
	011	Bad pen
	013	Font cartridge error
	020	No media
50	000	Wildcard error code. Used to return a display message to the controller

Device=#

Value (#)	Meaning
On	Directs the plotter to send a response whenever the status changes, except when a PJL syntax error occurs.
Verbose	Directs the plotter to send a response whenever the status changes, regardless of the cause.
Off	Turns off unsolicited status set by either DEVICE=ON or DEVICE=VERBOSE. Has no effect on unsolicited status set using the TIMED command.

Range: Only the values listed above are valid.

Default: Unsolicited responses are disabled, regardless of the status of the plotter.

Remark: When a response from the plotter is sent, it has the following syntax:

```
@PJL USTATUS DEVICE<CF><LF>
CODE=XXYYY<CR><LF>
<FF>
```

Where XX indicates the category and YYY indicates the error code. Status responses for category 20 will be generated only when DEVICE=VERBOSE is specified. Refer to the category and error code tables listed for TIMED.

Turn unsolicited
status off

@PJT USTATUSOFF (<CR>)<LF>

Use: This command can be used to disable the unsolicited status response enabled by use of the USTATUS command. It disables all unsolicited responses regardless of whether they were set using the DEVICE or TIMED command.

Read unsolicited
status options and
bounds

@PJT INFO USTATUS (<CR>)<LF>

Use: This command gives a series of strings listing the types of unsolicited status supported by the plotter. The listing will also contain the possible values that can be set (see the USTATUS command) as well as the current setting.

Here's a sample of how the returned data would be formatted (<HT> means "horizontal tab" [ASCII 9]):

```
@PJT INFO USTATUS<CR><LF>
DEVICE=ON [3 ENUMERATED]<CR><LF>
<HT>VERBOSE<CR><LF>
<HT>ON<CR><LF>
<HT>OFF<CR><LF>
TIMED=30 [2 RANGE]<CR><LF>
<HT>2<CR><LF>
<HT>300<CR><LF>
<FF>
```

Electromagnetic Compatibility (EMC)

FCC Statement (U.S.A.)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interferences by one or more of the following measures:

- reorient the receiving antenna
- increase the separation between the equipment and the receiver
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- consult the dealer or an experienced radio/TV technician for help

CAUTION

Pursuant to Part 15.21 of the FCC Rules, any changes or modifications to this equipment not expressly approved by the Hewlett-Packard Company, may cause harmful interference and void the FCC authorization to operate this equipment.

DOC statement (Canada)

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la class B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

**VCCI-2
(Japan)**

この装置は、第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

**Korean EMI
statement**

이 기기는 업무용으로 전자파장애검정을 받은 기기이오니 판매자 또는 사용자는 이점을 주의하시기 바라며, 만약 잘못 구입하였을 때에는 구입한 곳에서 비업무용으로 교환하시기 바랍니다.

**Geräuschemission
(Germany)**

LpA < 70 dB
am Arbeitsplatz
im Normalbetrieb
nach DIN 45635 T. 19

Telecommunications statement

**Telecommunications
General Approval
(UK)**

The HP DesignJet 650C plotter, Models C2858A and C2859A, are approved under Approval Number NS/G/1234/5/100003 for indirect connection to public telecommunications systems within the United Kingdom.

Declaration of conformity

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company

Manufacturer's Address: 16399 West Bernardo Drive
San Diego, California 92127-1899

declares that the product

Product Name: HP DesignJet 650C plotter

Model Numbers: C2858A, C2859A

Product Accessory: J2371A*, J2372A*, J2373A*, J2341A*: HP JetDirect interface cards; and C1642A: HP-IB interface card

conforms to the following Product Specifications:

Safety: EN 60950 / UL 1950 / CSA 22.2 No. 950
NEMKO TSE(74)DK203/92

EMC: EN 55022 (1988) / CISPR, class B
prEN 55024-2 / (1991): 3KV CD, 8KV AD
prEN 55024-3 (1992), 3 V/m
prEN 55024-4 (1992)
FCC Part 15 Class B / DOC B / VCCI-2

Supplementary Information: (1) The C2858A and C2859A were tested in a typical configuration using a Hewlett-Packard Personal Computer.
(2) Product options with asterisk (*) exhibit Class A operation.

To obtain a Material Safety Data Sheet (MSDS)

You can obtain current Material Safety Data Sheets for the pens (HP Part numbers 51640A [black], 51640C [cyan], 51640M [magenta], and 51640Y [yellow]) used in the plotter in one of the following ways.

- By calling the U.S. Hewlett-Packard Customer Information Center at the following number:

(800) 752-0900. Ask for Department MSDS, 6 a.m. to 5 p.m. Pacific Standard Time (PST).

- By mailing a request to this address in the USA:

Hewlett-Packard Direct Marketing Organization

Bldg. 51LSE

P.O. Box 58059

Santa Clara, CA 95051-8059

- By mailing a request to this address in Canada:

HP Canada

Attn: MSDS Request

2670 Queensview Drive

Ottawa, Ontario K2B8K1

- By using HP First: **(800) 333-1917.** (Available to customers in the U.S.A. and Canada only.)

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Warranty Statement

One-Year On-Site Hardware Warranty

Except when purchased as part of a system, Hewlett-Packard warrants your graphics peripheral hardware product against defects in materials and workmanship for a period of one year from receipt by the end user (proof of purchase required). If HP receives notice of such defects during the warranty period, HP will either, at its option, repair or replace products which prove to be defective.

Should HP be unable to repair or replace the product within a reasonable amount of time, customer's alternative exclusive remedy shall be refund of the purchase price upon return of the product.

If this product was purchased as part of an HP system in a coordinated shipment or as a system add-on, it is warranted against defects in material and workmanship during the same period as the HP system.

Service contracts are available from your local Hewlett-Packard Sales and Support office for coverage beyond the warranty period.

Exclusions

The above warranty shall not apply to defects resulting from: improper or inadequate maintenance by customer; customer-supplied software or interfacing; unauthorized modification or misuse; operation outside of the environmental specifications for the product; operation of nonsupported media; or improper site preparation and maintenance.

Warranty Limitations

HP makes no other warranty, either expressed or implied, with respect to this product. HP specifically disclaims the implied warranties of merchantability and fitness for a particular purpose. Some states or provinces do not allow limitations on the duration of an implied warranty, so the above limitation or exclusion may not apply to you. However, any implied warranty of merchantability or fitness is limited to the one year duration of this written warranty.

This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state, or province to province.

Obtaining Service During Warranty Period

If your hardware should fail during the warranty period, read the *Troubleshooting* chapter in this guide, then contact your local Hewlett-Packard Sales and Support Office or an Authorized HP Personal Computer Dealer Repair Center and arrange for on-site repair of the product. Retain proof of purchase in order to obtain warranty service.

After the Warranty Period

If your hardware should fail after the warranty period, read the *Troubleshooting* chapter in this guide, then contact an HP Sales and Support Office or call an Authorized HP Personal Computer Dealer Repair Center for details of the services available. If you have an HP Maintenance Agreement, request service under your agreement.

About this edition

Edition dates are as follows:

2nd edition, July 1993

New editions are complete revisions of the manual. Change sheets, which may be issued between editions, contain additional information. The dates on the title page change only when a new edition is published. Minor corrections that do not affect the function of the product may be made at reprint without a change to the print date.

Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one to one correspondence between product updates and manual revisions.



Reorder Number: C2858-90051
Manual Part Number: C2858-90011
Printed in U.S.A., July 1993